IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Lal et al.

Title: HUMAN MEMBRANE RECYCLING PROTEINS

Serial No.:	To Be Assigned	Filing Date:	Herewith
Examiner:	To Be Assigned	Group Art Unit:	To Be Assigned

Official Draftsman
Commissioner for Patents
Washington, D.C. 20231

SUBMISSION OF FORMAL DRAWINGS

Sir:

Transmitted herewith are Figures 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, 2E, 2F, 3A, and 3B, as twelve (12) sheets of formal drawings for this application. Each sheet of drawing indicates the identifying indicia suggested in 37 CFR Section 1.84(c) on the reverse side of the drawings.

Applicants believe that no fee is due with this paper. However, if the Commissioner determines that a fee is necessary, the Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. **09-0108. A duplicate copy of this communication is enclosed.**

If there are any questions regarding the above, the Examiner is invited to call the undersigned at 650-843-7352.

Respectfully submitted,

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Date: 24 April 2001

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76983   1

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                    9              18              27              36              45              54
5'  NGA  CGC  AGG  CGC  AAC   CCA  CGG  CTG  CGG  GGA   TCC  TTG  TGG  CCC  TTC  CGG  TCG

                   63              72              81              90              99             108
    ATG  GAA  CCA  ATC  CGT   GCA  CAG  AGA  AGC  GGG   GCG  AAC  TGA  GGC  GAG  TGA  AGT  GGA

                  117             126             135             144             153             162
    CTC  TGA  CTA  CCG  CCA   CTG  CTG  CGG  CGT  GGG   CAG  GGG  CGT  GGA  GGG  CAG  AGG

                  171             180             189             198             207             216
    GCC  GCG  GAG  GCC  GCA   GCA  AAC  ATG  GCT  CAG   AGC  AGC  AGA  GAC  GAC  GGA  AAC  CCG
                                       M    A    Q     S    S    R    D    D    G    N    P

                  225             234             243             252             261             270
    TTC  GCC  GAG  CCC  AGC   GAG  CTT  GAC  AAC  CCC   TTT  CAG  GAC  CCA  GCT  GTG  ATC  CAG
    F    A    E    P    S     E    L    D    N    P     F    Q    D    P    A    V    I    Q

                  279             288             297             306             315             324
    CAC  CGA  CCC  AGC  CGG   CGG  TAT  CAG  TAC  ACG   CTT  GAC  GTC  TAC  CCT  TTT  GAG  ACC
    H    R    P    S    R     R    Y    Q    Y    T     L    D    V    Y    P    F    E    T

                  333             342             351             360             369             378
    CGG  GAG  CCA  CCA  CCA   TAT  GAG  CCT  CCA  GCC   GCC  CCT  CCA  TTG  CCT  CCT  CCA  CCC
    R    E    P    P    P     Y    E    P    P    A     A    P    P    L    P    P    P    P

                  387             396             405             414             423             432
    TCA  GCT  CCC  TCC  TTG   CAG  CCC  TCG  AGA  AAG   AAG  CTC  AGC  CCC  ACA  GAA  CCT  AAG  AAC
    S    A    P    S    L     Q    P    S    R    K     K    L    S    P    T    E    P    K    N
```

FIGURE 1A

Nucleotide and deduced amino acid sequence (continued). Each numbered position marks the nucleotide coordinate; codons are shown with the single-letter amino acid translation below.

```
441  TAT GGC TCA TAC AGC    Y G S Y S
450  ACT CAG                T Q
459  GCT GCA                A A
468  GCA GCA GCA            A A A
477  GCT GAG CTG            A E L
486  CTG                    L

495  AAG AAA CAG            K K Q
504  GAG CTC                E L
513  AAG GCA                K A
522  GAG GAG TTG GAC        E E L D
531  GAG AGG GAG            E R E
540  CGA                    R

549  GAG CTG CAG CAT GCT    E L Q H A
558  GCC CTG                A L
567  GGC ACA                G T
576  ACT CGA CAG            T R Q
585  AAC AAT TGG            N N W
594  CCC                    P

603  CCT CTA CCT TCT TTT    P L P S F
612  TGT CCA                C P
621  CAG GTT                Q V
630  TTT TTC TGC            F F C
639  GAC ATC TCC            D I S
648  ATG                    M

657  GAG ATC CCC CAA GAA    E I P Q E
666  TTT CAG                F Q
675  ACT GTA                T V
684  ACC ATG                T M
693  TAC CTC TGG            Y L W
702  ATG                    M

711  TGC AGC ACG CTG GCT    C S T L A
720  CTT CTC                L L
729  AAC TTC                N F
738  GCC TGC                A C
747  GCC AGC TTC            A S F
756  TGT                    C

765  GTG GAA ACC AAC AAT    V E T N N
774  GGC GCA                G A
783  TTT GGG                F G
792  TCT ATC CTC            S I L
801  TGG GTC CTC            W V L
810  CTT                    L
```

FIGURE 1B

```
     819         828         837         846         855         864
TTC ACT CCC TGC TCC TTT GTC TGC TGG TAC CGC ATG TAT AAG GCT TTC CGG
 F   T   P   C   S   F   V   C   W   Y   R   M   Y   K   A   F   R

     873         882         891         900         909         918
AGT GAC AGT TCA TTC AAT TTC GTT TTC ATT TTC TTC GTC GCT CAG GAT
 S   D   S   S   F   N   F   V   F   I   F   F   V   A   Q   D

     927         936         945         954         963         972
GTG CTC TTT GTC CTC CAG GCC ATT GGT ATC CCA GGT TGG GGA TTC AGT GGC TGG
 V   L   F   V   L   Q   A   I   G   I   P   G   W   G   F   S   G   W

     981         990         999        1008        1017        1026
ATC TCT GCT CTG GTG GTG CCG AAG GGC AAC ACA GCA GTA TCC GTG CTC ATG CTG
 I   S   A   L   V   V   P   K   G   N   T   A   V   S   V   L   M   L

    1035        1044        1053        1062        1071        1080
CTG GTC CTG CTC TTC ACT GGC ATT GCT GTG CTA GGA ATT GTC ATC CTG AAA
 L   V   L   L   F   T   G   I   A   V   L   G   I   V   I   L   K

    1089        1098        1107        1116        1125        1134
CGG ATC CAC TCC TTA TAC CGC ACA GGT GCC AGC TTT CAG AAG GCC CAG CAA
 R   I   H   S   L   Y   R   T   G   A   S   F   Q   K   A   Q   Q

    1143        1152        1161        1170        1179        1188
GAA TTT GCT GCT TTC TCC GGT GTC AAC CCT GCG GTG CGA ACC GCA GCT AAT
 E   F   A   A   F   S   G   V   N   P   A   V   R   T   A   A   N
```

FIGURE 1C

```
        1197          1206          1215          1224          1233          1242
GCA GCC GCT GGG GCT GAA AAT GCC TTC CGG GCC CCG TGA CCC CTG ACT GGG
 A   A   A   G   A   E   N   A   F   R   A   P

        1251          1260          1269          1278          1287          1296
ATG CCC TGG CCC TGC TAC TTG AGG GAG CTG ACT TAG CTC CCG TCC CTA AGG TCT

        1305          1314          1323          1332          1341          1350
CTG GGA CTT GGA GAG ACA TCA CTA ACT GAT GGC TCC TCC GTA GTG CTC CCA ATC

        1359          1368          1377          1386          1395          1404
CTA TGG CCA TGA CTG AAC CTG ACA GGC GTG TGG GGA GTT CAC TGT GAC CTA

        1413          1422          1431          1440          1449          1458
GTC CCC CCA TCA GGC CAC ACT GCT GCC ACC TCT CAC ACG CCC CAA CCC AGC TTC

        1467          1476          1485          1494          1503          1512
CCT CTG CTG TGC CAC GGC TGT TGC TTC GGT TAT TTA AAT AAA AAG AAA GTG GAA

        1521
CTG GAA CTG   3'
```

FIGURE 1D

```
          9            18            27            36            45            54
5' NCC GGA AGT  GGA GGG TCT  ACA CGA AGC  GCC GCT GGG  TCT GGG TGC  CCG GAG GCA


          63           72            81            90            99           108
   GCA GCG GAG  TTC GCG CGC  TGG CCC CCG  ATC ACC ATG  TCG GCT TTC  GAC
    A   A   E    F   A   R    W   P   P    I   T   M    S   A   F    D


         117          126           135           144           153           162
   ACC AAC TTC  GCG GAC CCA  GTG GAT GTA  AAC CCC TTC  CAG GAT CCC  TCT GTG
    T   N   F    A   D   P    V   D   V    N   P   F    Q   D   P    S   V


         171          180           189           198           207           216
   ACC CAG CTG  ACC AAC GCC  GCC CCG CAG  GCG GGC CTG  GAA TTC AAC  CCC TTC TCA
    T   Q   L    T   N   A    A   P   Q    A   G   L    E   F   N    P   F   S


         225          234           243           252           261           270
   GAG ACA AAT  GCA GCA GCG  ACA ACA GTT  CCT GTC ACC  CAA CTC CCT  GGG TCC TCA
    E   T   N    A   A   A    T   T   V    P   V   T    Q   L   P    G   S   S


         279          288           297           306           315           324
   CCA GCG GTT  CTC CAG CAG  CCA TCA GAA  GTG CCA ACC  CAG ACC CCG  CCC CAG GCC
    P   A   V    L   Q   Q    P   S   E    V   P   T    Q   T   P    P   Q   A


         333          342           351           360           369           378
   GTG TCT GCA  GCC CAG GCA  GGC GCA GGG  CTG CTC CGG  CAG CAG CAG  GAA GAA CTG  GAC AGG AAA
    V   S   A    A   Q   A    G   A   G    L   L   R    Q   Q   Q    E   E   L    D   R   K
```

FIGURE 2A

```
          387                 396                 405                 414                 423                 432
GCT GCC   CTG GAA CGC   AAG GAG GAG   CTG CAG AAC   ACT GTA GCC   AAC TTG
 A   A     L   E   R     K   E   E     L   Q   N     T   V   A     N   L

          441                 450                 459                 468                 477                 486
CAT GTG   AGA CAG AAC   AAC TGG CCC   CTG CCC TCG   TGG TGC CCT   GTG AAG CCC
 H   V     R   Q   N     N   W   P     L   P   S     W   C   P     V   K   P

          495                 504                 513                 522                 531                 540
TGC TTC   TAT CAG GAT   TTC TCC ACA   GAG ATC CCT   GCC GAC TAC   CGG ATA TGC
 C   F     Y   Q   D     F   S   T     E   I   P     A   D   Y     R   I   C

          549                 558                 567                 576                 585                 594
AAG ATG   CTC TAC TAT   TGG ATG TTG   CAT TCA GTG   ACT CTG TTT   CTG AAC CTG
 K   M     L   Y   Y     W   M   L     H   S   V     T   L   F     L   N   L

          603                 612                 621                 630                 639                 648
CTT GCC   CTG TGC TGG   TTC TCG GGC   AAC AGC TCC   AAG GGA GAC   TTT GGC
 L   A     L   C   W     F   S   G     N   S   S     K   G   D     F   G

          657                 666                 675                 684                 693                 702
CTC TCC   ATC CTG TGG   TTT CTG ATC   TTC ACT CCC   TGT GCC TTC   CTT TGT TGG   TAC
 L   S     I   L   W     F   L   I     F   T   P     C   A   F     L   C   W     Y

          711                 720                 729                 738                 747                 756
CGA CCC   ATC TAT AAG   GCC TTT AGG   TCC GAC AAC   TCT TTC AGC   TTT TTT GTG   TTC
 R   P     I   Y   K     A   F   R     S   D   N     S   F   S     F   F   V     F
```

FIGURE 2B

```
765          774          783          792          801          810
TTC TTT GTA  TTT TTT TGT  CAA ATA GGG  ATC TAC ATC  ATC CAG GTT  GGC ATC
 F   F   V    F   F   C    Q   I   G    I   Y   I    I   Q   V    G   I

819          828          837          846          855          864
CCT GGC CTG  GGG GAC AGC  GGT TGG ATT  GCA GCC CTG  TCT ACA CTG  GAT CAT
 P   G   L    G   D   S    G   W   I    A   A   L    S   T   L    D   H

873          882          891          900          909          918
TCC CTG GCC  ATA TCA GTC  ATC ATG ATG  GTG GTG GCT  GGC TTC TTC  ACC CTC TGT
 S   L   A    I   S   V    I   M   M    V   V   A    G   F   F    T   L   C

927          936          945          954          963          972
GCC GTG CTC  TCA GTC CTC  CTG CTG CAG  CGG GTG CAC  TCC CTC TAC  CGA CGG ACA
 A   V   L    S   V   L    L   L   Q    R   V   H    S   L   Y    R   R   T

981          990          999          1008         1017         1026
GGG GCC AGC  TTC CAG GCC  CAG GAG GAG  TTT TCC CAG  GGC ATC TTC  AGC AGC
 G   A   S    F   Q   A    Q   E   E    F   S   Q    G   I   F    S   S

1035         1044         1053         1062         1071         1080
AGA ACC TTC  CAC AGA GCT  GCT TCA TCT  GCT GCC CAA  GGA GCC TTC  CAG GGG AAT
 R   T   F    H   R   A    A   S   S    A   A   Q    G   A   F    Q   G   N

1089         1098         1107         1116         1125         1134
TAG TCC TCC  TCT CTT CTC  TCC CCC TCA  GCC TTT CTC  TCG CCT GCC  TTC TGA GCT
```

FIGURE 2C

```
        1143        1152        1161        1170        1179        1188
GCA CTT TCC GTG GGT GCC TTA TGT GGT GGT TGT GCC CAG CAC AGA CCT GGC

        1197        1206        1215        1224        1233        1242
AGG GTT CTT GCC GTG GCT CTT CCT CCT CCC TCA GCG ACC AGC TCT CCC TGG AAC

        1251        1260        1269        1278        1287        1296
GGG AGG GAC AGG GAA TTT TTT CCC CCT CTA TGT ACA AAA AAA AAC AAA GCT CTC

        1305        1314        1323        1332        1341        1350
TTT CCT TCT CTG GTG ATG GTT TGG TAG GAT TCT TTT GTC TCT GGA AGC AGT GGG

        1359        1368        1377        1386        1395        1404
ACT GAA GTT CTC TTC GTC CTG TGC ACA CAC AGA CAC CCC CAC ACA GTT GGG ATC

        1413        1422        1431        1440        1449        1458
ACA GGC TGA CCT GGG CCC ATC CCA GCT GGA GCT TTC TGC CAG GGT CCT GGG CCT

        1467        1476        1485        1494        1503        1512
TGA CTC CCC CAC CCT GCA GGC CTG GCC TGA ATC TGG CTT CTT AGA CAC AGC CCA

        1521        1530        1539        1548        1557        1566
GTC CTT CCT GCC TGG GCT GGG AAT AAG CCT CTC ACA GGT TCT GGT GGA CAG ATC

        1575        1584        1593        1602        1611        1620
TGT TCC CCA GGT CAC TCC AGT GGT CTC CAG GCT CTC CAG GAG AGA GAA GGC TGG TTG CCT
```

FIGURE 2D

```
     1629            1638            1647            1656            1665            1674
CAA GCT CTT     CTC TGC CTC     ATA AAC GGA     TCC AGA GAA GGC     TGG TTG CCT     TAA GCT

     1683            1692            1701            1710            1719            1728
CTT CCC TGC     CTC GTG TTC     CTG AGA AAC GGA     TTA ATA GCC     CTT TAT CCC     CCT GCA

     1737            1746            1755            1764            1773            1782
CCC TCC TGC     AGG GGA TGG     CAC TTT GAG     CCC TCT GGA GCC     CTC CCC TTG     CTG AGC

     1791            1800            1809            1818            1827            1836
CTT ACT CTC TTC     AGA CTT TCT     GAA TGT ACA GTG     CCG TTG GTT GGG     ATT TGG GGA

     1845            1854            1863            1872            1881            1890
CTG GAA GGG ACC     AAG GAC ACT     GAC CCC AAG CTG TCC     TGC CTA GCG     TCC AGC GTC

     1899            1908            1917            1926            1935            1944
TTC TAG GAG GGT     GTC TGC     CTG TCC TGG TGT GGT     TGG TTT GGC     CCT GTT TGC

     1953            1962            1971            1980            1989            1998
TGT GAC TAC CCC     CCC TCC     CCG AAC CGA GGG ACG     GCT GCC TTT GTC     TCT GCC

     2007            2016            2025            2034            2043            2052
TCA GAT GCC ACC     TGC CCC GCC     CAT GCT CCC CAT CAG     CAG CAT CCA     GAC TTT CAG

     2061            2070            2079            2088            2097            2106
GAA GGG GAC CAG     CCA GTC     CAG AAC CGC ATC CCT     CAG CAG GGA GGA     CTG ATA AGC
```

FIGURE 2E

```
      2115      2124      2133      2142      2151      2160
CAT CTC TCG GAG GGC CCC CTA ATA CCC AGT GGA GTC TGG TTC ACA CCC TGG GGG

      2169      2178      2187      2196      2205      2214
GTG TGT CAC TGT GAT GGG ACA CGT AGG AGT CCA CCC TTA AAA CCA GCA CCC TGT

      2223      2232      2241      2250      2259      2268
CCC TCG AGG CTG CCG AGT GGG TGT GTG GAC TGG GGT GCC TTC CCA CAA AAC TAG

      2277      2286      2295      2304      2313      2322
CCT CCG GCT CTG GGC CCG AGA CAG CCG CAG GCC CCA ACT GAA TGA TAC TGG

      2331      2340      2349      2358      2367      2376
CAG CGG CTG GGG TTT TAT GAA CTC CTT TCT GGT ATT TTT TCC CCT CTA TGT ACA

      2385      2394      2403      2412      2421      2430
AAT GTA TAT GTT ACG TCT CAA TTT TTG TGC TTA AGT AAA AAT AAA AAC ATT TTC

AGA C 3'
```

FIGURE 2F

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 1   M A Q S R D G G N P F A E P S E L D N P F Q D P A V I Q H R P S R Q Y A T L D V    980615
 1   M S A F - - D T N P F A D P - V D V N P F Q D P S V T Q L T N A P Q - G G L A E    412453
 1   M S D F - - D S N P F A D P - D L N N P F K D P S V T Q V T R N V P - P G L D E    GI 487057

41   Y N P F E T R E P P A Y E P P A P A P L P P P S A P S L Q P S R K L S P T E P    980615
37   E N P F S E - - T N A - - - - A T T V P V T Q L P G S S - Q P A V L Q P S V E P    412453
37   Y N P F S D S R T P P - - - - P G G V K M P N V P - N T - Q P A I M K P T E E H    GI 487057

81   K N X G S Y S T Q A S A A A T A E L L K Q E E L N R K A E E L D R R E R E L    980615
70   T Q P T - - P Q A V V S A - A Q A G L L L R Q Q E E L D R K A A A L E R K E R E L    412453
71   P A Y T - - Q I T K E H A L A Q A E L L K R Q E E L E R K A A E L D R R E R E M    GI 487057

121  Q H A A L G G T A T R Q N N W P P L P S F C P V Q P C F F Q D I S M E I P Q E F    980615
107  Q N T - V A N L H V R Q N N W P P L P S W C P V K P C F Y Q D F S T E I P A D Y    412453
109  Q N L - - S Q H G R K N N W P P L P S N F P V G P C F Y Q D F S V D I P V E F    GI 487057

161  Q K T V S T M Y Y L W M C S T L A L L N F L A C L A S F C V E T N N G A G F G    980615
146  Q R I C K M L I Y Y L W M L H S V T L F L N L L A C L A W F S G N S S K G V D F G    412453
146  Q K T V K L M Y Y L W M F H A V T L F L N I F G C L A W F C V D S S R A V D E G    GI 487057
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FIGURE 3A

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201  L S I L W V L L F T P C S F V C W Y R P M Y K A F R S D S S F N F F V F F F I F   980615
186  L S I L W F L I F T P C A F L C W Y R P I Y K A F R S D N N S F S F V F F F V E   412453
186  L S I L W F L L F T P C S F V C W Y R P L Y G A F R S D S S E R F E V F F E F V Y   GI 487057

241  F V Q D V L F V L Q A I G I P G W G F S G W I S A L V - V P K G N T A V S V L M   980615
226  F C Q I G I Y I I Q L V G I P G L G D S G W I A A L S T L D N H S L A I S V I M   412453
226  I C Q F A V H V L Q A A G F H N W G N C G W I S I S L L T G L N K N - I P V G I M M   GI 487057

280  L L V A L L F T G I A V L G I V M L K R I H S L Y R R T G A S F Q K A Q Q E F A   980615
266  M V V A G F F T L C A V L S V F L L Q R V H S L Y R R T G A S F Q Q A Q E E F S   412453
265  I I T A A L F T A S A V I S L V M F K K V H G L Y R T T G A S F E K A Q Q E F A   GI 487057

320  A G V F S N P A V R T A A A N A A A - - - - G A A E N A F R A P   980615
306  Q G I E S L S R T E H R A A S - - - - - - S A A Q L G A F Q G N   412453
305  T G V M S N K T V Q T A A A N A A S T A A T S A A Q N A E K G N Q M   GI 487057
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FIGURE 3B